Pemphigonotus Lamb.

One species of this genus has hitherto been known from Australia, the genotype *P. mirabilis* Lamb, from Melville Island (type locality) and Darwin, the latter recorded by Malloch (1938, p. 354). There are also two females in the U.S. National Museum from Buderim Mt., Queensland, December, 1889.

An unusual male specimen from Darwin appears to represent an unnamed species. According to published descriptions of *mirabilis*, strong sexual dimorphism is to be expected in this genus, but the species before me differs from the published description of the male of *mirabilis*, and differs from other known species of the genus in characters not usually involved in sexual dimorphism.

I published notes and a tentative key to the genus in 1940 (*Annals Mag. Nat. Hist.*, ser. 11, 6: 421–424). Most of the species, which are chiefly Oriental, are easily distinguished from the Australian ones by having at least the third segment entirely black. Only in *mirabilis*, in the small (3 mm.) *P. ochrostoma* (Becker) from New Guinea, and in the species described here, are the antennae entirely yellow. The present species is near *mirabilis* in its large size and in the wing venation, with long discal cell, long and diagonally placed hind crossvein, and fringe of very long hairs on the first section of costa. However, the male of *mirabilis* is described as having the middle femur and tibia "clothed with abundant long tangled hairs", whereas the hairs are short and appressed in the new species. Lamb also made no mention of any peculiar development of the fore tibia or of the mesonotum centrally, such as are found in *peculiaris*.

Pemphigonotus peculiaris, n. sp.

Large orange-yellow species with entirely yellow antenna, black hind tibia, white and black marked fore tibia, peculiarly depressed and pruinose median stripe on the mesonotum, and unusually long hairs on first section of costa.

Male.—Predominantly shining and orange-yellow, the small ocellar tubercle polished black, broad sublateral mesonotal stripes polished reddish, halteres ivory-white, wings entirely brown; legs orange-yellow, except as follows: hind tibia black except for narrow reddish stripes on extensor surface; mid tibia brown to blackish anteriorly and dorsally; fore tibia white with broad black dorsal stripe and an expanded, flattened, velvet black area antero-dorsally on basal third; all tarsi brown. Hairs in general light yellowish-brown to dark brown, the long costal hairs black.

Head broad, its width 1·6 times its length, with broad shining front, depressed in the present specimen though possibly not naturally so, still approximately as long as broad and twice the width of an eye; frontal triangle not clearly defined, a narrow glabrous darker stripe extending from ocellar tubercle to the anterior margin, with the flat areas flanking it slightly more shining than remainder of front, the whole shining flat area (if that constitutes the frontal triangle) at its base slightly more than half (0·55) the width of front, with two irregular rows of hairs on its surface, merging imperceptibly with those of front; eye bare; head in profile 1·1 times as high as long; cheek broad, slightly more than one-third the height of conspicuously bulging eye and three-fourths the breadth of large third antennal segment; front barely projecting before eyes and face weakly receding; proboscis short, labella fleshy, third antennal segment large, suborbicular, length and breadth subequal, but upper margin slightly concave at insertion of slender bare arista; no bristles developed, the erect and cruciate ocellars and post-verticals slightly longer than hairs but not usually distinct from them.

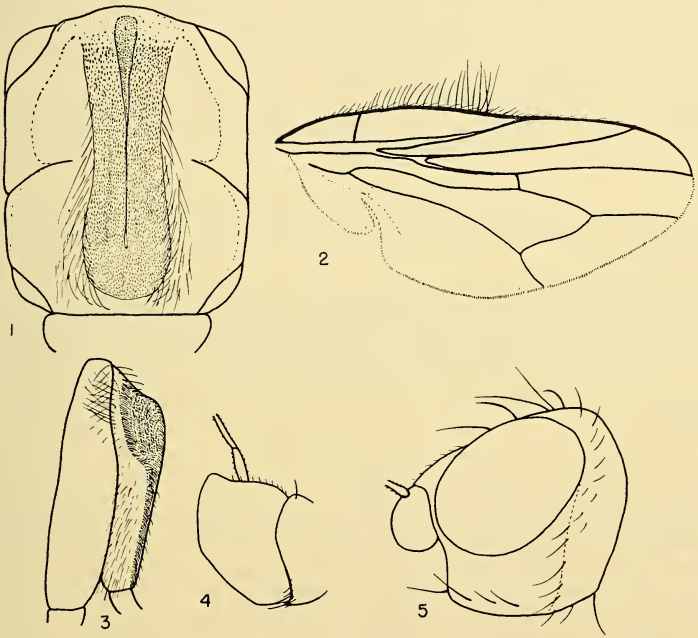
Thorax above (Text-fig. 1) with peculiar median depressed area, which is densely pruinose and varying with the light from dull brown to shimmering silvery-brown, on the median line a narrow groove which is wider anteriorly, the whole depressed area bare of hairs; remainder of mesonotum, and the convex scutellum, covered with long suberect hairs, those bordering the median depression especially long and appearing almost as a row of pale bristles; mesopleuron sparsely pale-haired; usual thoracic bristles not developed, or not easily distinguished from the long hairs. Abdomen short and much broader than thorax and, like it, with numerous pale erect hairs.

Fore leg as figured (Text-fig. 3), fore tibia broadened on basal third to form what may be a sensory area, the anteroventral surface of tibia and anterior surface of femur opposite the area conspicuously long-haired; mid and hind femora and tibiae with usual short appressed hairs, those of mid leg not long-haired as described for male *mirabilis*; hind tibia with large sensory area posterodorsally.

Wing as figured (Text-fig. 2), notable for the long costal hairs on basal portion, ending abruptly at subcostal break, the long first costal sector, long and distally broadened discal cell, and long and obliquely placed hind crossvein.

Length, 4·5 mm.; of wing 4·5 mm.

Holotype, male, Darwin, N.T., Australia, March, 1945 (B. Malkin). Type No. 62372 in the U.S. National Museum.



Text-figures 1-5.

1, 2, 3, *Pemphigonotus peculiaris*: 1, mesonotum; 2, wing; 3, anterior aspect of left femur and tibia, fore leg. 4, *Batrachomyia occidentalis*, antenna. 5, *Lasiopleura tonnoiri*, profile of head.

Eutropha noctilux (Walker).

Oscinis noctilux Walker, 1859, *Jour. Linn. Soc.* (*Zool.*), 3: 126 (Aru Islands). *Chlorops nicobarensis* Schiner, 1868, *Reise der Novara*, p. 244 (Nicobar Is.). *Chlorops fuscipennis* Thomson, 1868, *Eugenies Resa*, p. 603 (Rossi Is.). *Pseudoformosina nicobarensis* (Schiner) Malloch, 1938, Proc. Linn. Soc. N.S.W., 63: 355, genotype of *Pseudoformosina* Malloch. *Eutropha noctilux* (Walker) Sabrosky, 1940, *Annals Mag. Nat. Hist.*, ser. 11, 6: 420. New generic combination, with *nicobarensis* and *fuscipennis* in synonymy; *Pseudoformosina* a synonym of *Eutropha*. *Pseudoformosina noctilux* (Walker) Malloch, 1941, Proc. Linn. Soc. N.S.W., 66: 64. *Nicobarensis* in synonymy. *Eutropha noctilux* (Walker) Sabrosky, 1952, *Verh. Naturf. Ges. Basel*, 63 (1): 216.

A wide-ranging Oriental and East Indian species which Malloch mentioned in his Australian revision as probably to be found in northern Australia. Malloch erected a new genus for it, but after study of the genotype of *Eutropha* Loew I am convinced that *Pseudoformosina* is a synonym. The above citations will bring the Australian list up to date.

Subfamily Oscinellinae.

Lasiopleura Becker (= *Parahippelates* Becker).

A key to eighteen species and one variety from Australia and Tasmania was published by Malloch (1940, pp. 268–270). A few notes and one new species from New Zealand are added below. It should also be noted that there is a complex of species, involving *parva* Malloch, *pallipes* Malloch, *aequalis* Becker, *taylori* Malloch, and some possibly undescribed species, whose accurate determination is difficult without fully matured specimens in good condition. The material before me is not sufficient to do more than indicate that identifications in this part of the genus must be made with unusual caution, and that some clarification needs to be done and perhaps new species distinguished from very similar forms.

As far as I am aware, the new species described below is the first species of *Lasiopleura* to be recorded from New Zealand, although a number of species are known from Australia and the Oriental region.

Lasiopleura pruinosa (Thomson), n. comb.

Oscinis pruinosa Thomson, 1868, *Eugenies Resa*, p. 606 (Sydney, New South Wales). *Parahippelates seticauda* Malloch, 1928, Proc. Linn. Soc. N.S.W., 53: 301, 302 (Victoria). [*New Synonymy.*]

The generic reference is based on my examination of type material of *pruinosa* in the Naturhistoriska Riksmuseum in Stockholm, and paratypes of *seticauda* which are before me. Previous authors have listed Thomson's species in *Oscinella* or *Oscinosoma*, except for Duda (1934, *Arbeiten morph. taxon. Ent. Berlin-Dahlem*, 1: 44), who referred it to *Parahippelates*. However, he admitted that the species was unknown to him, and in his paper it will not key out to that name, but rather will pass directly to *seticauda* Malloch.

Lasiopleura tonnoiri, n. sp.

Small black species with polished black frontal triangle, broad cheek (0·40 the eye height), tiny hind tibial spur, and black legs.

Female.—Black, the anterior half of front yellow to orange-yellow, face and cheeks whitish-yellow, almost silvery, palpus yellow, third antennal segment slightly marked with orange basally below, and halter lemon-yellow; coxae and legs black, the knees narrowly reddish and tarsi brown; bristles generally black (cf. note on variation); vibrissal seta, the row of setae along lower margin of cheek, postocular rows, and all hairs of head, body and legs pale whitish-yellow, glistening in the light at certain angles; wing hyaline, veins brown.

Head in profile (Text-fig. 5) subquadrate, as long as high, the front sloping and only slightly projecting beyond eye, the latter with long axis diagonal and 1·5 times the short axis. Cheek broad, 0·40 times greatest vertical height of an eye and approximately as broad as height of third antennal segment; vibrissal angle approximately 90 degrees. Front moderately broad, at vertex 2·5 times width of an eye and nearly 0·60 times width of head, and approximately as long as broad; frontal triangle barely more than half length of front and well separated from eyes at vertex, chiefly smooth and polished black, the ocellar tubercle, basal corners and side margins bright grey pruinose. Antennae relatively small, third segment subquadrate, slightly broader than long; arista relatively short, with microscopic pubescence seen only with high power. The usual cephalic bristles strongly developed: proclinate and divergent ocellars, erect and cruciate postverticals, mesoclinate inner and lateroclinate outer verticals, and three pairs of more or less proclinate orbitals.

Thorax black, dark grey pruinose, including the metanotum and upper portion of pleuron; the sternopleuron, except posterior half of narrow upper margin, the anterior two-fifths of mesopleuron, and the anterior spiracle and area immediately behind and below it polished black, without pruinosity; scutellum brownish to brown-grey; thoracic bristles long and strong: two humeral, 1 + 1 notopleural, 1 presutural, 1 supra-alar, 1 postalar, dorsocentrals 0 + 3, the anteriormost directly opposite the ends of the incomplete mesonotal suture but apparently a postsutural bristle, 1 subapical and 1 apical scutellar; moderately strong prescutellar acrostichals may or may not be present; disc of scutellum with two to six long pale hairs. Abdomen black, subshining, densely grey pruinose.

Legs slender; posterodorsal sensory area on hind tibia short and narrow, less than one-fifth length of tibia; hind tibial spur black and strong, easily distinguished from hairs under high power, but short, only half the greatest diameter of tibia, and thus relatively inconspicuous.

Wing: Second to fourth costal sectors (between apices of first to fourth veins) as 22:16:6:5; veins three and four slightly divergent, fourth vein ending at apex of wing; penultimate section of fourth vein 1·4 times that of third vein and 0·60 times that of fifth vein; small crossvein at about two-thirds length of discal cell; hind crossvein straight, half the length of penultimate section of fourth vein, and at right angles to penultimate sections of fourth and fifth veins.

Length, 1·75–2 mm.

Holotype and three paratypes, all females, Tahuna, New Zealand, August 27, 1922 (A. Tonnoir). Type and one paratype to be returned to the Canterbury Museum, two paratypes in the U.S. National Museum.

This species is quite unlike any of the Australian species (cf. Malloch, 1940), which have the frontal triangle pruinose. Its affinities are rather with several Oriental and East Indian species, including *L. meijerei* Sabrosky (1952) (= *ornatifrons* Meijere, preoccupied). In Duda's 1934 key to the Oriental and Australian species, *tonnoiri* passes to *ornatifrons* but differs by hyaline wing, black legs including fore coxa, and broad cheek.

Variation: Some variation is apparently to be expected in the colour of the bristles, most of which are black and strongly developed. In the type the postverticals are black, but they are yellow in the other three specimens. The type shows three black orbital bristles on the right, but two black and one (anterior) yellow on the left, whereas two paratypes show only the anterior pair of orbitals yellow, and the third paratype has the upper two orbitals on the left and all orbitals on the right yellow. The thoracic bristles are more constantly black, but even here an occasional bristle is pale.

Batrachomyia Krefft.

Krefft, 1864, *Trans. Ent. Soc. N.S.W.*, 1 (1863): 100. Skuse, 1889, Proc. Linn. Soc. N.S.W., ser. 2, 4: 174.

In his papers on the Australian Chloropidae, Malloch regularly credited the genus to Skuse (1889). However, in 1941 (*Annals Ent. Soc. Amer.*, 34: 749), I pointed out that the generic name was first proposed by Krefft (1864), who published on the life history and figured the larva, pupa, host and a wing of the adult fly. Skuse (1889) was the first to mention species in connection with the name *Batrachomyia*.

It is interesting to note the resemblance between this genus and *Pemphigonotus* Lamb in the large and robust habitus (for chloropids), the hairy mesopleuron, unusually long first vein, broad costal cell, and presence of a posterodorsal sensory area on the hind tibia. *Pemphigonotus*, however, has the costa stopping at the third vein and belongs to the Chloropinae. The lack of pubescence on the eyes in the latter genus is another conspicuous feature separating it from *Batrachomyia*.

Malloch's key (1940, p. 264) to his six Australian species may be modified in part as follows, to place *Chlorops vicaria* Walker and the new species described below, as well as to indicate the position of the two species described by Skuse in 1889.

Partial Key to Batrachomyia.

1. Thorax reddish-yellow, with shining black stripes on mesonotum 2
   Thorax reddish-yellow, the mesonotum at most with a suggestion of reddish stripes. ..... *B. nigritarsis* Skuse (= *varipes*) and others. (cf. Malloch, 1940, p. 264.)
2. Third antennal segment entirely black, somewhat triangular in outline, dorsal margin longer than ventral and anterodorsally somewhat angulate 3
   Antenna yellow to orange-yellow except for black arista and sometimes a small spot at its base; third antennal segment small, suborbicular, upper margin shorter than lower and anterodorsally rounded and not angulate. ..... *B. quadrilineata* Skuse; *B. major* Mall.; *B. strigipes* Mall.
3. Palpus black; anterior crossvein nearly opposite outer three-fourths of discal cell, the penultimate section of fourth vein only slightly longer than that of third vein. ..... *B. vicaria* (Walker).
   Palpus yellow; crossveins well separated, the anterior at or slightly before middle of discal cell, and penultimate section of fourth vein thus four times the length of penultimate section of fifth vein. ..... *B. occidentalis*, n. sp.

Batrachomyia nigritarsis Skuse.

Batrachomyia nigritarsis Skuse, 1889, Proc. Linn. Soc. N.S.W., ser. 2, 4: 175–176, Plate 10, figs. 2–5*a* (New South Wales). *Batrachomyia varipes* Malloch, 1940, Proc. Linn. Soc. N.S.W., 65: 264 (Victoria). Probable synonym.

The descriptions of *varipes* and *nigritarsis* are so similar that I have little doubt of their identity. The combination of reddish-yellow thorax (without black stripes), black antennae, and characteristically black-marked legs sets the species off from all others known from Australia. All femora narrowly at apex, the fore and mid tibiae, the hind tibia at base and apex, and all tarsi are black.

Batrachomyia vicaria (Walker), n. comb.

Chlorops vicaria Walker, 1849, *List Dipterous Insects British Mus.*, 4: 1120 (Australia).

Becker, in his 1911 monograph of the Indo-Australian Chloropidae, referred *vicaria* to *Scoliophthalmus*, apparently because of Walker's mention of the "nearly triangular" third antennal segment. It was thus listed by Malloch (1931) in his catalogue of the Australian Chloropidae (Proc. Linn. Soc. N.S.W., 56: 75). However, the type in the British Museum (Nat. Hist.), now lacking third antennal segments, shows that the species is close to *Batrachomyia*. In wing venation, antenna, and general habitus, it is similar to the new species described below, but I am informed by Dr. F. van Emden that the type apparently lacks ordinary hairs on the mesopleuron, though it has dense pile. With generic limits in this family still not well established, one cannot be sure whether a new genus is appropriate or whether the generic characterization of *Batrachomyia* should be altered. Biological information may some day shed light on this. In the meantime, it is clear that *vicaria* is far removed from *Scoliophthalmus*, and that in wing and general habitus it is suggestive of *Batrachomyia*. Accordingly I refer it there until additional material makes possible further study of its position.

Batrachomyia occidentalis, n. sp.

Yellow species with shining black mesonotal stripes, black and subtriangular third antennal segment, and yellow palpus.

Female.—Yellow, marked with black as follows: Arista, large spot encompassing the ocellar tubercle and equally broad area behind it, connecting with broad black band across upper three-fifths of occiput, the band only narrowly separated from eyes; three broad shining mesonotal stripes, the median full length from neck to scutellum, the lateral distinctly divided at mesonotal suture into a slightly broader anterior portion and a posterior portion; supra-alar vittulae, large humeral spot, metanotum, and spots on meso- (anterodorsal spot and smaller one on lower margin), ptero-, sterno-, and hypopleuron, all thoracic spots highly polished; abdomen brown, subshining; median plate of clypeus brown to blackish; bristles black; hairs of front dark, but otherwise hairs yellow to whitish-yellow; wing hyaline, veins brown.

Head slightly collapsed, but front obviously broader than an eye, though only three-fourths as broad as long; frontal triangle polished, apically rounded and exceedingly short, barely showing around ocellar tubercle; third antennal segment large (Text-fig. 4), 1·5 times as broad as long, dorsal margin longer than lower and giving segment a subtriangular appearance; arista relatively short, its length to height of third segment as 3 to 2, and barely longer than the whole antenna, microscopically pubescent; bristles short, outer verticals and postverticals longest and strongest; ocellars and postverticals erect, cruciate at tips; upper three-fifths of front with five pairs of erect black orbital bristles, subequal in length to inner verticals, the anterior orbitals hairlike and merging with frontal hairs, the latter numerous, short but conspicuous.

Thorax polished, without pollen or tomentum; mesonotum and scutellum with numerous fine silky hairs, which, however, do not interrupt the polished appearance; scutellum quite flattened on disc, almost as in *Thaumatomyia* (= *Chloropisca*), with three pairs of black scutellar bristles grouped together near apex, the apical pair slightly longer than the others.

Wing with first vein long, extending midway on wing; costal sectors one to four as 40:35:18:10; costal and marginal cells broad, submarginal and first posterior cells relatively narrow; first and second veins anteriorly concave, third only very slightly so and almost straight on its outer half, and fourth anteriorly convex, the third and fourth veins thus strongly divergent at apex of wing; ultimate section of fifth vein slightly longer than penultimate section of fourth; other characters as in key.

Length of body 4 mm., of wing 4 mm.

Holotype, female, Dongarra, Western Australia, Oct. 4–10, 1935 (R. E. Turner). Type in the British Museum (Nat. Hist.).

This species is noteworthy in having the scutellum so distinctly flattened. Another species before me, either *B. dubia* Malloch or near it, shows a suggestion of flattening, but such species as *major* and *atricornis* have the scutellum highly convex.

It is interesting to record this species from far western Australia. The previously described species, except possibly *vicaria*, which was recorded only from "Australia", are from New South Wales, Victoria and Tasmania.

Caviceps defecta (Becker).

Oscinella defecta Becker, 1911, *Ann. Mus. Nat. Hungarici*, 9: 163 (Java).

Malloch (1924, Proc. Linn. Soc. N.S.W., 49:356) certainly appeared to refer *defecta* to his new genus *Caviceps*, but perhaps he did not intend to make a positive reference inasmuch as he later (1927) mentioned *C. flavipes* as the only known species of the genus. Still later (1940) he stated that he had said that *defecta* "probably belonged". At any rate, I have seen the type in Amsterdam, and it unquestionably belongs to *Caviceps*.

A male example of *Caviceps* from Dongarra, Western Australia, Aug. 23–Sept. 5, 1935 (R. E. Turner) [British Museum (Nat. Hist.)] may or may not represent a new Australian species. This fully matured specimen has darker legs than described for either *flavipes* or *defecta*, the legs being yellow with brown to blackish marks as follows: All coxae, a narrow and weak median band on mid femur, the median third to two-fifths of hind femur and hind tibia, and narrow median bands on fore and hind tibiae. The concave face is black, as described for *defecta*. It is possible, in view of the close similarity in other characters, that colour variation or difference in degree of maturity of specimens may be involved, and I would not wish to describe this single individual without supporting material.

Scoliophthalmus Becker.

As noted under *Batrachomyia*, *Chlorops vicaria* Walker is not a *Scoliophthalmus* and can be deleted from that genus in the Australian catalogue.

Lioscinella Duda.

Malloch had little material from Western Australia, and from the few specimens which I have seen thus far it appears that a number of new species remain to be found there. In this large genus the species are often very close, and their proper distinction will take careful study, and above all longer series than were available to Malloch in most cases, in order to be sure of variation in colour and maturity, and any sexual dimorphism. I am not satisfied with the generic assignments of Australian species in this portion of the subfamily, but must postpone that more complex task for the present.

Lioscinella flavoapicalis (Malloch), n. comb.

Oscinosoma flavoapicalis Malloch, 1931, *Rec. Canterbury Mus.*, 3: 411 (New Zealand). *Oscinosoma diversipes* Malloch, 1931, *l.c.*, p. 414 (New Zealand). *Lioscinella nigropolita* Malloch, 1941, Proc. Linn. Soc. N.S.W., 66: 47 (New South Wales; Australian Capital Terr.; "Darwin, N.T."). [*New Synonymy.*]

Malloch misinterpreted the labels on two paratypes of *nigropolita* and recorded them as "N. Territory: Darwin (Palmerston)". In reality, the labels read "Palmerston Nth [North] N.Z.". Although Malloch recognized no species of the genus as common to Australia and New Zealand, this appears to be one. Both the holotype (New South Wales) and allotype (Austral. Cap. Terr.) of *nigropolita*, and the two paratypes now recognized as being from New Zealand, are before me, and I can find no evident difference, nor did Malloch, as he included all in the same type series. Accordingly, the prior name for the species is *flavoapicalis* Malloch. *Oscinosoma diversipes*, synonymized by Miller (1950, Catalogue Diptera New Zealand Subregion, p. 110), is the slightly smaller male of the same species. I may also note that the name *flavoapicata* used three times by Malloch (1931, *l.c.*, p. 414) is only a lapsus or typographical error for *flavoapicalis*.

THE *CULEX PIPIENS* GROUP IN SOUTH-EASTERN AUSTRALIA. III.

AUTOGENY IN CULEX PIPIENS FORM MOLESTUS.

By N. V. Dobrotworsky, Georgina Sweet Fellow in Economic Entomology, University of Melbourne.

(One Text-figure.)

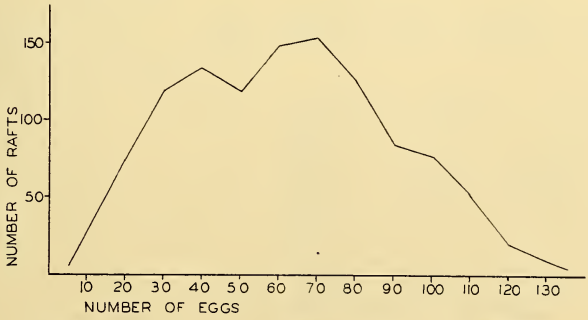
[Read 27th October, 1954.]

Synopsis.

The number of eggs in rafts, laid autogenously, varies from seven up to one hundred and thirty-five. High temperatures do not influence the frequency of autogeny, but reduce the number of eggs laid and their viability. Females prefer polluted water for oviposition, but do not avoid clean water entirely. The frequency of autogeny in wild populations of Victorian *molestus* is high; it varies from 46·6 per cent. to 94·2 per cent.

Study of autogeny in *C. pipiens* L. led to the separation of the autogenous form *molestus* from the anautogenous *pipiens, s.str.* (Roubaud and Gaschen 1932, Marshall and Staley 1935, 1937, Jobling 1938) and initiated a wide discussion on the taxonomic status of *molestus*. The separation of *molestus* and *pipiens, s.str.*, is based mainly on biological characters and the most important diagnostic character of *molestus* is its autogeny.

It is now well established that autogeny is an inherited character and that it depends on the ability of the larva to build up a large fat body which permits the maturation of eggs without a blood meal. Moreover, in autogenous mosquitoes, formation of eggs commences in virgin females immediately after emergence from the pupa. This phenomenon has been observed in the three known autogenous species found in Victoria (*C. pipiens* form *molestus*, *Aëdes concolor* Taylor and *Tripteroides tasmaniensis* Stricl.), and can be used as a basis for recognizing autogeny in forms which do not readily mate, or oviposit, in the laboratory.



Text-fig. 1.—The number of the eggs in rafts laid autogenously.

Only one egg-raft can be produced autogenously; each later oviposition must be preceded by a blood meal. In my experiments, the maximum number of rafts produced by a single female was six; Laven (1951) states that this number may be exceeded. The number of eggs usually decreases at each successive oviposition: in a group of five females the autogenous raft contained an average of 101 eggs; the following five, each deposited after a meal of human blood, contained an average of 84, 81, 73, 70, and 49 eggs respectively.

The number of eggs in the autogenous raft is variable. In counts of 1152 rafts the number ranged from 7 to 135; the mean was 57·7 (Text-fig. 1). The size of these rafts is undoubtedly affected by the larval diet. When this is poor, the fat body is small and there is, in consequence, a reduction in the number of eggs. Tate and Vincent (1936) and Shute (1951) have observed that a poor larval diet also reduces the frequency of autogeny. This would imply that there is a correlation between the frequency of autogeny and the size of the egg-rafts. The data of Table 3 tend to support this view, but statistical analysis has shown that the correlation is barely significant.

TABLE 1.

The Influence of Temperature on Autogeny.

Number of Females.	Temperature.	Percentage Autogenous.	Number of Eggs.		Viability.
			Total.	Average.	
50	20° C.	80	2912	72·8	90·0%
50	31° C.	80	2275	56·9	58·8%

Raft size is also influenced by temperature. In one experiment, the adults reared from a single batch of eggs were divided into two groups; one group was maintained at 20°C, the other at 31°C. The higher temperature did not affect the frequency of autogeny but reduced the number of eggs laid and their viability (Table 1).

The preference shown by *molestus* for breeding in polluted water, rich in decaying organic matter, is notorious, but it also breeds in clean water. Thus, in Cairo, Knight and Malek (1951) found it in clear water ground pools and wells; it is found in similar situations in Victoria. That this is due to a lack of more suitable breeding sites was

TABLE 2.

Autogeny and Siphonal Index in Wild Populations of molestus.

Date of Collection.	Number of Females.	Locality.	Habitat.	Percentage Autogenous.	Number of Eggs in Raft.			Siphonal Index.		
					Min.	Max.	Mean.	Min.	Max.	Mean.
March–April ..	52	Yarram.	Liquid manure.	94·2	11	114	65·2	3·6	4·9	4·5
April	120	Rosanna.	Liquid manure.	55·3	10	46	23·3	3·7	4·5	4·2
March–April ..	110	Spotswood.	Liquid manure.	86·4	20	121	85·5	3·8	4·6	4·3
March	125	Melbourne.	Liquid manure.	76·8	31	100	56·0	3·6	4·5	4·2
February ..	110	Melbourne.	Concrete pit.	50·0	13	68	38·1	3·7	4·6	4·3
August–September	91	Ringwood.	Quarry.	67·0	15	106	43·7	3·8	4·6	4·3
February–March	146	Pt. Lonsdale.	—	50·7	21	96	59·4	3·5	4·5	4·1
May–June ..	103	Moe.	—	46·6	7	44	23·4	3·9	4·7	4·4
	Average		.. ..	65·8	—	—	49·3	—	—	4·3

shown by an experiment in which three containers (20″ × 20″) were filled, the first with a manure infusion, the second and third with clean water; the third container was black, the others white. During May, 75 rafts were laid in the first container, two in the second and one in the third. The ovipositing females evidently select sites which provide optimum conditions for the larvae.

While *molestus* is described as an autogenous mosquito, many authors (Mathis 1940, Knight 1951, Knight and Malek 1951, Mattingly 1952, 1953) have claimed that the frequency of autogeny is low in natural populations; Mattingly has suggested that the high frequency observed in laboratory colonies is a result of unconscious selection. This, no doubt, is true of some strains of *molestus*, but in Victoria, as the following observations show, the frequency is high in wild populations.

Larvae and pupae were collected from various natural breeding places and brought into the laboratory where they completed their development in water from the original sites. Each day the emerged adults were removed to cages (1000 c. inches) provided with an oviposition dish and cotton wicks soaked in a sugar solution. The cages were kept in a constant temperature room at 25°C. A count of the egg-rafts was continued for twenty days following the introduction of the last adult. The results are shown in Table 2. In two localities, Point Lonsdale and Moe, where the breeding sites were not found, engorged females were collected from a chicken house and a bedroom respectively; the figures for these groups refer to an F_1 population reared from these females.

In the eight populations, the proportion of autogenous females ranged from 46·6 per cent. to 94·2 per cent., with an average of 65·8 per cent. This figure agrees with that of Theodor (1953) who reported that in Israel 70 per cent. of '*pipiens*' are autogenous.

The siphonal index (Table 2) was uniform throughout the eight strains; no differences in adult, or larval, morphology were observed.

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AN F1 HYBRID BETWEEN *EUCALYPTUS CINEREA* F. MUELL. AND *EUCALYPTUS ROBUSTA* SM.

By L. D. Pryor.

(One Text-figure.)

[Read 24th November, 1954.]

Synopsis.

The experimental production of a viable F1 between *E. robusta* Sm. and *E. cinerea* F. Muell., from the series Transversae and section Macrantherae (Normales) is recorded. Inheritance of some juvenile characters is intermediate in the F1, while others resemble either parent.

The systematic schemes proposed for various genera often give a good indication of genetic relationships. This is true of Maiden's scheme for the eucalypts which Blakely (1934) developed and presented in the "Key to the Eucalypts".

In a large genus such as this it would indeed be surprising if the first monographs were entirely in accord with the relationships of the species as determined by genetic

E. cinerea. The F1 hybrid. *E. cinerea* × *E. robusta.* *E. robusta.*

Although the F1 is taller than the two parents, it is too early to say whether there is hybrid vigour or not.

study. Duffield (1952) has pointed out in connection with the genus *Pinus* that established systematic treatment aids genetic study and, conversely, genetic study aids systematic review. The evidence presented here helps to establish affinity between two groups.

The primary subdivision of the genus in the work mentioned is made on the basis of the shape and characters of the anthers. There is an amount of evidence (Pryor, 1951, 1953) to show that some such groups—as, for example, the Renantherae—coincide